Moving the Collections of an Academic Health Sciences Library

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ABSTRACT

Expansion of the physical facilities of the Health Sciences Library at the University of North Carolina at Chapel Hill necessitated relocating the entire journal and book collections within the library. This paper discusses the problems involved in planning such a move, the gathering and analysis of relevant data, the formulation of an overall plan based on the data analysis, and the actual move. The use of specially-written computer programs greatly aided in the move's planning and execution and also yielded quantitative data describing the characteristics of an academic health sciences collection.

WHEN THE Health Sciences Library at the University of North Carolina at Chapel Hill was planning the relocation of its collections to new stack floors, several substantive descriptions of moves in the available library literature [1–6] proved useful. However, limited attention has been devoted in the literature to the problem of planning a move of a journal collection [4, 7] or to the possibility of using a computer to facilitate the process [8]. Journal collections, which make up a high percentage of health sciences libraries' holdings, present unique problems because varying amounts of growth space for each title must be allocated. A computer program can simplify calculations and make more sophisticated decisions feasible. This paper describes a strategy for shifting a library collection to a new location, with attention devoted to the use of a computer program to plan the move of a journal collection. Although we will be outlining a process undertaken at one specific library, the general approach may be adapted to other libraries.

At the time of the move, in 1980, the library's collection consisted of approximately 177,000 volumes, two-thirds of which were journals. The library owned approximately 4,300 journal titles, with a large number of additional titles on order. The journals were shelved by title in alphabetical order; the books were shelved in order of classification number. The relocation was largely a matter of moving one collection; the only consolidation required was for a limited number of low-use journal titles which were shelved out of alphabetical sequence on another floor. The collections, which had been housed on two stack floors, were to be moved to three new floors, with the journals occupying two floors and the books one floor; each new floor had two major stack areas.

The objectives of the planning for the collection move were: (1) to determine how to allocate empty shelf space in order to minimize future shifting of the collection; (2) to choose logical breaks in the distribution of journal titles and book classification numbers between floors and areas of floors; and (3) to pinpoint the future location of journal titles and book classification sections precisely enough to allow simultaneous moving of several portions of the collections.

We decided early to use a computer to aid both in planning the move and in the move's execution. Use of a computer offered several advantages: (1) The computer offered the obvious advantage of being able to analyze a large quantity of data accurately and quickly. (2) Use of a computer made it feasible to test the effects of various decisions beforehand in order to make the optimal choice. For example, before deciding exactly how many years' growth space to leave after each current title, several different choices were tested and evaluated with respect to how much additional space would remain to be apportioned. (3) Use of a computer also allowed data from individual journal titles to be analyzed cumulatively. This became useful when mapping the future location of specific

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titles onto floor plans of the new stacks. (4) Computer printouts were produced which were used by the shelvers during the actual move. Although both the data collection and analysis represented a significant investment in terms of staff time, the same amount of time would have been required for data collection if a computer had not been used. In either case information about individual titles had to be collected. However, the time required to make the subsequent calculations manually would have exceeded greatly the time spent in computer programming and entering data. The computer made it possible to make the decisions described below as well as to provide aids for the move which could not have been produced manually.

Data Collection

Data about the extent and predicted growth of the journal and book collections were gathered by the circulation staff. The data were then analyzed via a computer program or manually.

Journal Collection

A data-gathering form was devised for recording information about each journal title held by the library. The journal holdings card for each title in the Kardex was photocopied onto the bottom half of the form. The top half of the form provided space to record a sequentially assigned identification number; a symbol indicating whether the title was current, ceased, or on order; the total number of shelves presently occupied by the title, rounded to the nearest half-shelf; and, for current titles, the annual growth rate estimated from the number of inches occupied by last year's issues. A current title was defined as one which the library currently receives; a ceased title was defined as a title which the library no longer receives, most frequently due to the cessation of journal publication. As one person progressed alphabetically through the Kardex preparing the data-gathering forms, another took the packets of forms to the appropriate journal stack sections and took measurements. Completed forms were then passed on to those entering the data into the computer. A line of data for each title was entered into on-line computer files of the local campus computer using computer terminals in the library. After data were proofed for accuracy and edited if necessary, files were merged onto magnetic tape to construct one data file for all journal titles held by the library. This portion of the study was completed by the circulation staff during the relatively slower summer months during their regular daytime and evening work hours and required a span of approximately three months with four circulation staff members each spending one to four hours per day. After the journal data file was completed, PL/1 programs were written to analyze the data and to produce printouts to aid in reshelving the collection in its new location.

Book Collection

The shelf space occupied by each classification section of the book collection was measured, inclusive of those empty spaces caused by books off the shelf. This total measurement thus approximated the occupancy of the total book collection, regardless of items which were off the shelf. For planning purposes, however, it was desirable to estimate the actual linear footage of books which would have to be moved. Samples were taken of the number of books in daily circulation during the period of shelf measurements. Since the shelf measurements were taken during the time of year with lowest circulation, comparisons of estimated average number of books checked out on a given day during August, the month of measurement, and October, the anticipated month of the move, were done. The average width of a single book was also ascertained by sampling several hundred books throughout the collection. These two estimates—the number of books expected to be checked out at the time of the move and the average width of a book—made it possible to predict more accurately how many shelves of books would actually be moved from the old to the new shelves. Measurement of the book collection was done by a circulation staff member during normal working hours over a span of approximately two weeks. All data analysis for the book collection was done manually.

Results of Data Analysis

Journal Collection

Data indicated that the premove journal collection occupied 4,057 shelves of the total 4,884 existing shelves, representing an occupancy rate of 83%. The new building offered 7,988 shelves for journals (counting six shelves per stack section), representing a 51% initial overall occupancy after the move. During the first phase of data analysis, occupancy over the next several years, based on the annual growth rates of existing current titles, was estimated. As Table 1 indicates, the average annual growth rate of current titles was 2.6″ per year (1.7″ median; 1″ to 53″ range). Since 91% of current titles had an annual growth rate of 5″ or less, an annual growth rate of 5″ was used for all on-order

TABLE 1

OCCUPANCY AT VARIOUS YEARS AFTER MOVE BASED ON ANNUAL GROWTH RATES OF EXISTING CURRENT TITLES

Year After Move	Occupancy (%)
0	51
3	58
5	62
7	67
9	72

titles. Thus, based on the existing collection, the new shelving space would allow for approximately seven years' collection growth before reaching two-thirds capacity, considered by some as comfortable [9].

Allowing for annual growth of current titles was but one of the factors to consider in deciding how to distribute the additional space in the new journal stacks. A more detailed analysis of the actual number and space requirements for current and ceased titles relative to the titles' initial letter of the alphabet yielded additional information (Table 2).

Since the new journal shelves were to be equally distributed on two separate floors of the new building, it was necessary to decide where the alphabetical arrangement would split between the floors. For user convenience, it was strongly desired to have a clean break such that no letter of the alphabet was split between floors. Titles from A to I occupied 49% of the total premove occupied space, while titles from J to Z occupied 51% of this space (Table 2). Thus, splitting the journals in this manner accomplished the goal of not splitting a letter between the floors, and also very nearly distributed

TABLE 2

PERCENTAGE DISTRIBUTION OF FREQUENCY OF JOURNAL TITLES AND SPACE OCCUPIED BY CURRENT, CEASED, AND ON-ORDER TITLES BY INITIAL LETTER OF TITLE

Initial Letter of Title	Number of Titles					Space Occupied		
	Current (%)	On Order (%)	Ceased (%)	Total No.	Total (%)	Current (%)	Ceased (%)	Total (%)
A	49	5	46	754	17	65	35	21
B	46	4	50	301	7	65	35	8
C	62	8	30	349	8	63	37	7
D	46	7	46	110	2	49	51	3
E	53	10	37	125	3	64	36	3
F	51	16	33	61	1	68	32	1
G	46	4	50	50	1	53	47	1
H	44	14	42	124	3	61	39	2
I	55	6	39	187	4	57	43	3
J	58	9	33	588	14	79	21	15
K	33	0	67	18	<1	33	67	1
L	53	12	35	43	1	81	19	2
M	40	4	56	217	5	53	47	5
N	44	11	45	140	3	60	40	4
O	50	9	41	58	1	61	39	1
P	42	6	52	340	8	64	36	7
Q	19	0	81	32	1	37	63	<1
R	36	4	60	172	4	47	53	3
S	50	5	45	211	5	72	28	4
T	26	5	69	200	5	40	60	3
U	34	8	58	38	1	33	67	<1
V	34	3	63	32	1	39	61	1
W	44	2	54	52	1	40	60	1
X	50	0	50	2	<1	30	70	<1
Y	53	0	47	47	1	67	33	1
Z	17	1	82	81	2	25	75	4
	$\bar{X}$ = 48	$\bar{X}$ = 6	$\bar{X}$ = 46	N = 4,332	100	$\bar{X}$ = 62	$\bar{X}$ = 38	100

the occupied space between the two new floors equally.

Table 2 also provides information about sections of the collection which can be expected to grow more than others in the future. Forty-eight percent of the titles actually held by the library were current and occupied 62% of the premove shelves. Conversely, 46% were ceased titles which occupied 38% of the premove shelves. Six percent of the total number of titles were on order and occupied no space at the time of shelf measurement. As expected, journals whose titles begin with A and J occupied the largest amount of space and represented the greatest number of actual titles. The Cs accounted for only 7% of the occupied shelves, but 70% of the titles beginning with C were current or on-order titles, compared to 54% of the As and 67% of the Js. By comparison, Zs, which required 3% of the occupied shelves, had only 18% current titles. Thus, in addition to that space left to accommodate growth of presently existing current titles, it seemed desirable to leave extra growing room in the expanding areas such as the Cs rather than among the Zs, since it appeared that new journal titles added to the collection would more likely have titles beginning with C than Z.

Using all of the above information, several different schemes were considered for the detailed distribution of the journals on the new shelves. Obviously, space needed to be left to allow for annual growth of existing titles and for the future addition of new titles. Beyond that, there was the question of how to distribute the additional space—whether to leave space equally throughout the entire collection or to leave periodic groups of sections empty. The ultimate goal of minimizing reshifting in the future suggested that additional space be integrated into the collection. However, it was also considered undesirable to spread journals out so thinly that browsing would be difficult. A combination of these approaches seemed to produce the most reasonable strategy.

The final plan for overall space distribution is shown in Figure 1. The plan represented a combination of space for five years' annual growth for current titles (12% of available space); a minimum amount of empty space in each stack section, accomplished by leaving the bottom shelf of six available shelves empty in all stack sections (17% of available space); a minimum amount of space between all titles, in addition to the annual growth space already left after current titles, accomplished by leaving approximately 12 inches at the end of each journal run (18% of available space); and

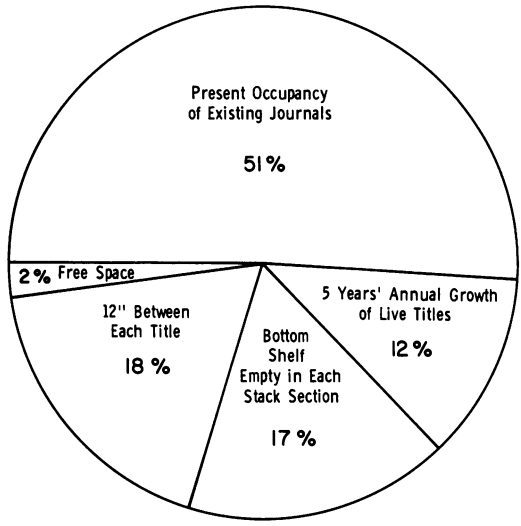

FIG. 1.—Initial distribution of space in the new journal stacks.

additional space allotted at intervals in sections more likely to have new titles in the future (2% of available space). We decided to allow for five years' annual growth, anticipating that portions of the older journal collection will be moved to a new central library archive facility within the next five years. Using these guidelines, the exact amount of space to leave after each individual journal title was calculated by a computer program. From these calculations, it was possible to map out each stack range so that movers knew in advance which title would begin at each side of each range, thus allowing several areas to be moved simultaneously.

Book Collection

Calculating space requirements for the book collection was considerably simpler than for the journal collection, since there was no need for information on a per title basis as was true for journals. Thus, an overall analysis of the space requirements and the space available provided information to devise a plan. The total book collection occupied 1,766 shelves (5,150 linear feet), including gaps from which approximately 1,340 books had been checked out. We estimated that at the actual time of the move, approximately 1,200 additional books would be checked out. The average width of a book was found to be 1.1 inches. From this information, it was predicted that the actual move would involve approximately 1,685 shelves of books. Calculations indicated that leaving the bottom shelf of each six-shelf section empty and filling each shelf half full would result in the

TABLE 3

PERCENTAGE OF OCCUPIED SPACE BY VARIOUS CLASSIFICATION SECTIONS IN THE BOOK COLLECTION

Classification Section	Space Occupied (%)
A–G	2
H	4
I–P	1
Q	26
S–V	2
W	63
Z	2
Total	100

use of 3,372 of the 3,992 available shelves, leaving several additional empty sections to distribute throughout the collection.

As with journals, moving several portions of the book collection simultaneously was required, so it was necessary to calculate exactly where different sections of the classification scheme would begin on the new shelves. Table 3 presents summary figures for the extent of each classification section. More detailed breakdowns indicated where it was reasonable to split classification numbers between sides of the floor (for example, between WH and WI) and appropriate starting places for each simultaneously moved section. As for journals, floor plans were drawn to show movers in which exact stacks each section of the classification would be located.

For both journals and books, future available shelving space was calculated using six shelves per section. An added expansion factor not reflected in the calculations was that most stack sections can accommodate a seventh shelf in the future if necessary. A survey of the premove collection indicated that only 31% of the journal sections housed journals that were too tall to permit the addition of a seventh shelf.

THE MOVE

Two teams of four persons each were scheduled to move material eight hours a day. Three of the people on each team were hired through a temporary personnel agency; they were assisted by one library staff member. On the teams, one person loaded volumes from the old shelves to book trucks, one moved book trucks by elevator from the old to the new location, one unloaded volumes from the book trucks to the new shelves, and one library staff member supervised the unloading. The supervisor was responsible for following predetermined guides for spacing the volumes on the shelves, compensating for any problems encountered with spacing, insuring that all journal titles were accounted for, posting stack labels and temporary directional signs, filling in statistics logs, and supervising the temporary employees.

Guides for the journal move included a printout (Table 4) listing each journal title, its status, length of run in number of shelves, and space to leave after each title in number of shelves. As discussed earlier, the amount of vacant shelf space provided for five years' growth space for current titles plus a foot for all titles. Table 4 also includes a running count

TABLE 4

SAMPLE PRINTOUT USED BY SHELVERS DURING ACTUAL MOVE

Title	Status	Length of Run	Space to Leave	Cum	Free
AMER J MEDICAL ELECTRONICS	D*	0.1	0.3	433.3	1586.7
AMER J MEDICAL GENETICS	L†	0.1	0.5	433.9	1586.1
AMER J MEDICAL JURISPRUDENCE	D	0.1	0.3	434.3	1585.7
AMER J MEDICAL SCIENCES	L	11.5	0.6	446.4	1573.6
AMER J MEDICAL TECHNOLOGY	L	2.0	0.6	449.0	1571.0
AMER J MEDICINE	L	9.0	2.0	460.0	1560.0
AMER J MEDICINE INDEX	L	0.1	0.5	460.6	1559.4
AMER J MENTAL DEFICIENCY	L	2.0	0.6	463.2	1556.8
AMER J NEURORADIOLOGY	R‡	0.0	1.0	464.2	1555.8
AMER J NURSING	L	12.5	1.4	478.1	1541.9
AMER J NURSING CUM INDEX	L	0.1	0.5	478.7	1541.3

*D: ceased
†L: current
‡R: on order

of the cumulative total number of shelves occupied thus far (Cum) and the total number of free shelves still remaining (Free).

A floor plan for supervisors also indicated the beginning and ending journal titles on each side of each double-faced range and the locations of entire sections to be left empty in addition to the space left between titles. A floor plan for the book move showed the beginning location of each letter of the classification, with larger classification sections subdivided so that approximately one checkpoint per range was indicated. The stacks themselves could not be labeled far in advance since they were often being moved from the old stack floors just before the move of the volumes themselves.

Checkpoints were predetermined stack sections at regular intervals at which the supervisors could make adjustments if the actual placement of volumes did not match the estimates on the floor plans. The adjustments were simple procedures to correct any problems which might arise due to such factors as miscalculations in measuring 4,300 titles, rounding errors, or an unexpected number of books checked out. The procedures called for leaving an extra empty shelf per section if the actual placement of volumes were ahead of the location predicted on the floor plan or putting volumes on the normally empty bottom shelf and filling shelves to 75% capacity rather than 50% in the case of the book collection if the placement were beyond the floor plan. Adjustments were to be made frequently to equalize space throughout the stacks and to prevent major problems at the finishing points of the shift.

The complete move required two teams working 15.5 days to move approximately 177,000 volumes originally housed in 1,327 single-faced sections, meeting the requirement of the construction schedule that the library vacate existing stack floors within twenty-five working days to avoid incurring a penalty. The move's duration corresponded very closely to our original estimates based on samples of previous moves on a smaller scale. However, the period also included time required by our particular circumstances of using a combination of new shelving and existing shelving on the new stack floors: down time when the stack assemblers lagged behind the movers and time spent moving volumes to temporary locations and later reshifting them so the stacks could be freed for disassembling and moving.

The planning proved to be very successful. Only a few adjustments in spacing needed to be made as the move progressed. The checkpoints were so accurate that two teams could move simultaneously, beginning at any checkpoint, and not just from the few fixed beginning points for major areas such as a group of ranges on one side of a floor.

The smooth execution of the move pointed to the need for the elements of planning which had been undertaken: establishment of objectives and priorities, detailed measurements of collections and shelf space, estimates of time and personnel required, and thorough planning and training of staff concerning methodology.

References

1. Kephart JE. Moving a library (revised). Urbana: University of Illinois Library School, 1952. (University of Illinois Library School occasional papers, no. 30).
2. Spyers-Duran P. Moving library materials. Rev. ed. Chicago: American Library Association, 1965.
3. Kurth WH, Grim RW. Moving a library. New York: Scarecrow Press, 1966.
4. Lumb AE. Moving an academic library: a case study. J Libr 1972 Oct;4:253–71.
5. Shercliff WH. Removing a college of education library: a case study of the removal of 70,000 books. Educ Libr Bull 1974 Summer;17:15–27.
6. Moran RF. Moving a large library. Spec Libr 1972 Apr;63:163–71.
7. Broaddus B, Hurlebaus A. Planning and implementing a major journal shift in a health sciences library. Bull Med Libr Assoc 1981 Oct;69:395–6.
8. Tatterton E, Braid A. A moving story; the transfer of material to phase I of the NLL's new building. NLL Rev 1973 Jan;2:145–53.
9. Metcalf KD. Planning academic and research library buildings. New York: McGraw-Hill, 1965.

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